

Applicant : Ying Wen Hsu
Appl. No. : 10/676,628
Examiner : Lepisto, Ryan
Docket No. : 16131.4002 (formerly 703427.4002)

Amendments to the Claims

1-2. (Cancelled)

3. (Currently amended) ~~The apparatus of claim 1, further comprising~~ An apparatus for switching an optical signal, the apparatus comprising:

a substrate;

a movable microstructure formed by a semiconductor process on the substrate, the movable microstructure being suspended at a distance from the substrate and being adapted to move relative to the substrate;

an actuator to cause the movable microstructure to move from a first position to a second position relative to the substrate;

a mirrorless light-guiding structure mounted to the movable microstructure such that the mirrorless light-guiding structure moves with the movable microstructure, the mirrorless light-guiding structure including a first set of optical paths and a second set of optical paths such that when the movable microstructure is in the first position, the optical signal travels along the first set of optical paths in the light-guiding structure, and when the movable microstructure is in the second position, the optical signal travels along the second set of optical paths in the mirrorless light-guiding structure;

an input stationary waveguide coupled to the substrate and positioned to transmit the optical signal over a gap between the input stationary waveguide and the first set of optical paths in the mirrorless light-guiding structure, wherein the gap is oriented at an oblique angle to the input stationary waveguide and to the first set of optical paths of the mirrorless light-guiding structure; and

a notch in a first edge portion of the movable microstructure, the first edge portion extending in a Y direction, the microstructure having a second edge portion which extends in an X direction, the X and Y directions being substantially perpendicular

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to each other, the notch having a third edge portion and a fourth edge portion, wherein the fourth edge portion extends substantially parallel to the X direction, and wherein the optical signal enters the first set of optical paths at the fourth edge portion of the notch, wherein the gap is located adjacent to the fourth edge portion of the notch.

4. (original) The apparatus of claim 3 wherein the optical signal exits the first set of optical paths at the second edge portion of the movable microstructure.

5. (original) The apparatus of claim 3, wherein the movable microstructure is adapted to move in the X direction relative to the substrate.

6-12. (Cancelled)

13. (Currently amended) ~~The optical switching system of claim 11, further comprising~~ An optical switching system comprising:

(a) an input port comprising a stationary input light guiding structure adapted to receive a first optical signal, the stationary input light guiding structure being aligned to transmit the first optical signal to one of a plurality of optical switching devices;

(b) a plurality of output ports; and

(c) the plurality of optical switching devices coupled to the input port and adapted to receive the first optical signal from the stationary input light guiding structure and switch the first optical signal to one of the plurality of output ports, each optical switching device comprising:

(i) a substrate;

(ii) a movable microstructure formed by a semiconductor process on the substrate, the movable microstructure being suspended at a distance from the substrate and being adapted to move relative to the substrate;

(iii) an actuator adapted to cause the movable microstructure to move from a first position to a second position relative to the substrate;

(iv) a light-guiding structure mounted to the movable microstructure such that the light-guiding structure moves with the movable microstructure, wherein the

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light-guiding structure comprises a first set of optical paths and a second set of optical paths, such that when the movable microstructure is in a first position, the first optical signal travels along the first set of optical paths in the light-guiding structure, and when the movable microstructure is in a second position, the first optical signal travels along the second set of optical paths in the light-guiding structure;

(v) a gap formed between and defined by a first face of the stationary input light guiding structure and a second face of the first set of optical paths of the movable microstructure, wherein the gap causes the first optical signal to exit the stationary input light guiding structure at an oblique angle and to enter the first set of optical paths at an oblique angle; and

(vi) a notch in a first edge portion of the movable microstructure, the first edge portion extending in a Y direction, the microstructure having a second edge portion which extends in an X direction, the X and Y directions being substantially perpendicular to each other, the notch having a third edge portion and a fourth edge portion, wherein the fourth edge portion extends substantially parallel to the X direction, and wherein the first optical signal enters the first set of optical paths at the fourth edge portion of the notch, wherein the gap is located adjacent to the fourth edge portion of the notch.

14. (Cancelled)

15. (Currently amended) The optical switching system of claim 13, wherein the first optical signal exits the first set of optical paths at the second edge portion of the movable microstructure.

16-17. (Cancelled)